

SAW BLADE CALMPING DEVICE

FIELD OF THE INVENTION

The present invention relates to a saw blade clamping device for an electric saw. The saw blade can be easily and quickly fastened or
5 loosened by pulling a lever on the outside of the barrel of the electric saw.

BACKGROUND OF THE INVENTION

A conventional saw blade clamping device is disclosed in U.S. Patent No. 5,647,133 and Figs. 1 and 2, wherein the clamping device
10 includes a body 11 having a slot 111 for receiving a blade 20 therein and a passage 112 defined in communication with the slot 111. A tube 14 has a rod 13 received therein and the rod 13 includes a rectangular end 131 which fits an inner periphery of the tube 14. A spring 15 is mounted to the rod 13 and biased between the rectangular end 131 and the inside of
15 the tube 14. The rod 13 is threadedly extends through the body 11 and further has a contact end 12 which is able to contact a side of the blade 20. The body 11 includes a serrated surface 113 and the tube 14 is firmly urged by the spring 15 to contact the serrated surface 113. A user has to pull the tube 14 to remove the tube 14 away from the serrated surface 113
20 and then rotate the tube 14 so as to move the rod 13 to urge the blade 20 or disengage from the blade 20. The user has to use a force that overcomes the force of the spring 15 and simultaneously, rotate the tube 14. This is in convenient for the user to operate the tube 14 in two

different directions. Furthermore, it is difficult to estimate the force that the contact end 12 contacting the blade 20.

Figs. 3 and 4 shows the disclosures in U.S. Patent No. 6,023,848 which discloses a blade clamping device including a casing 31 and a base member 32 located in the casing 31. A first end of a biasing member 33 is connected to the base member 32. A blade 40 is engaged with the base member 32 and the biasing member 33 includes a protrusion portion 331 which urges against the blade 40. A lever 34 is pivotably connected to the casing 31 and includes an end that may pushes a free second end of the biasing member 33 to remove the protrusion portion 331 away from the blade 40. Although the biasing member 33 is easily to operate by operating the lever 34, the biasing member 33 quickly loses its biasing force after frequent operation by the lever 34.

The present invention intends to provide a blade clamping device that employs a cam member to firmly position the blade and a lever conveniently pivot the cam member to release the clamp of the blade.

SUMMARY OF THE INVENTION

In accordance with one aspect of the present invention, there is provided a blade clamping device for an electric saw which comprises a driving shaft having an extension extending from a distal end thereof and the driving shaft is inserted in a passage in a base member. A blade is connected to the driving shaft. An opening is defined through a side of

the base member and communicates with the passage. A cam member is pivotably engaged with the opening in the base member and a cam member of the cam member removably contacts the blade. A second end of the cam member is a bar. A first torsion spring is connected to the base member to maintain the cam head to contact the blade.

A casing is mounted to the base member and has an opening with which a lever is pivotably engaged. The lever includes a handle and a pushing end which is located beneath the bar of the cam member. The cam head of the cam member is pivoted away from the blade by the pushing end by pivoting the lever.

The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view to show a first conventional blade clamping device;

Fig. 2 is a cross sectional view to show the first conventional blade clamping device;

Fig. 3 shows a cross sectional view of a second conventional blade clamping device;

Fig. 4 shows that the biasing member is pushed by the lever to release the clamp of the blade of the second conventional blade clamping device;

Fig. 5 is a perspective view to show an electric saw with the blade clamping device of the present invention;

Fig. 6 is an exploded view to show the blade clamping device of the present invention;

Fig. 7 is a top view to show the torsion spring that maintains the cam member to contact the blade;

Fig. 8 shows the positions of the cam member and the lever which is not yet pivoted, and

Fig. 9 shows the lever is pivoted to remove the cam head of the cam member to release the blade.

DETAILED DESCRIPTION OF THE PREFERRED

EMBODIMENT

Referring to Figs. 5 to 8, the blade clamping device for an electric saw 50 of the present invention comprises a driving shaft 52 that extends from a distal end of a barrel 51 of the electric saw 50 and an extension 521 extends from a distal end of the driving shaft 52. A boss 523 extends from a side surface 522 of the extension 521 and two positioning holes 520 are defined through the driving shaft 52.

A base member 55 has a passage 551 defined therethrough and the passage 551 includes a first path 5511 and a second path 5512 which

communicates with the first path 5511. The driving shaft 52 is securely received in the first path 5511 by extending two pins 552 through the base member 55 and inserted in the two positioning holes 520. A blade 60 is inserted in the second path 5512 and includes a hole 61 through which the boss 523 extends. A stop 62 extends from an edge of the blade 60 and is stopped by an end surface of the base member 55. A first opening is defined through a side of the base member 55 and communicates with the second path 5512 of the passage 551. Two lugs 553 extend from the base member 55 with the first opening located therebetween. A tube 555 extends from one of the two lugs 553 and a slit 5551 is defined in the tube 555.

A cam member 554 is pivotably connected between the two lugs 553 of the base member 55 by a pin 56 and a first end of the cam member 554 is a cam head which is inserted in the first opening and removably contacts the blade 60. A second end of the cam member 554 is a bar 5542. A first torsion spring 556 is mounted to the tube 555 and one of two legs of the first torsion spring 556 is engaged with the slit 5551 and the other leg is inserted in a hole 5543 in the bar 5542 and presses the bar 5542 of the cam member 554. The first torsion spring 556 maintains the cam head to normally contact the blade 60.

A casing 53 is connected to the distal end of the barrel 51 of the electric saw 50 and has a second opening 532 defined in a side thereof. A lever 54 is pivotably engaged with the second opening 532 by a pin 544

extending through a plate 543 on an inside of the lever 54 and engaged with the opposite walls of the second opening 532. The lever 54 includes a handle 541 and a pushing end 542 which is located beneath the bar 5542 of the cam member 554. A second torsion spring 545 is mounted to the pin 544 and one of two legs of the second torsion spring 545 is hooked at an inside of the second opening 532 and the other leg is inserted in a hole in the plate 543.

As shown in Fig. 9, when releasing the blade 60, the user simply pulls the handle 541 of the lever 54 to let the pushing end 542 goes counter clockwise to push the bar 5542 of the cam member 554. The cam head of the cam member 554 is then pivoted away from the blade 60 so that the blade 60 can be removed from the second path 5512 of the passage 551 and a new blade can be installed. When releasing the handle 541, the second torsion spring 545 makes the pushing end 542 pivot clockwise and the first torsion spring 556 pivots the cam head of the cam member 554 to position the blade again.

This clamping device improves the shortcomings of the conventional blade clamping devices and allows the user to quickly and conveniently replace new blades. Besides, the force that the clamping member 554 applies to the blade 60 can be controlled in a pre-determined range.

While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled

in the art that further embodiments may be made without departing from the scope of the present invention.